UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

September 16, 1988

The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: SUITABILITY OF HIGH DENSITY POLYETHYLENE HIGH INTEGRITY CONTAINERS

During the fourth meeting of the Advisory Committee on Nuclear Waste, September 13-14, 1988, we met with the Low-Level Waste Management staff and reviewed the status of the staff's investigation into the suitability of high integrity containers (HICs) constructed from high density polyethylene (HDPE) for Class B or Class C low-level waste. This topic was also discussed during other ACNW meetings. The most recent reviews were held during the first meeting of the ACNW on June 28, 1988 and during the field trip to South Carolina, which was held in conjunction with the ACNW's third meeting on August 3-5, 1988. We also had the benefit of the documents referenced.

The Committee heard a well-structured presentation on the technical issues concerning the suitability of HDPE HICs for the disposal of low-level radioactive waste. The focal points of the presentation were the mechanical properties of the present designs and the ability of these designs to meet the NRC requirements for a satisfactory waste container. The staff had obtained expert technical opinion on the pertinent topics and had made effective use of dialogue among knowledgeable parties.

On the basis of the information presented to the Committee, it appears that the present designs of HDPE HICs will have difficulty in meeting the NRC criteria that define their mechanical properties for use as containers for Class B or Class C waste. We are mindful of HDPE's low corrosion rates which, when coupled with other materials that provide the necessary mechanical properties, could result in a container that should be able to satisfy the pertinent NRC criteria. Thus, we have not heard information that would eliminate HDPE from consideration as part of an HIC.

We recommend that the staff bring to closure its study of the HDPE HICs whose designs have been submitted to it for approval. We believe that

staff decisions would then allow the industry to better plan its response and further action, if any.

Sincerely,

Dade W. Moeller

Dade W. Moeller
Chairman

References:

1. Engineering Design and Testing Corporation Report, submitted to NUS July 21, 1986, "An Assessment of Polyethylene as a Material for Use in High Integrity Containers"
2. U.S. Nuclear Regulatory Commission draft report dated April 6, 1987, prepared by J. Pires, Brookhaven National Laboratory, "Review of the High Integrity Cask Structural Evaluation Program"
3. Letter dated February 2, 1988 from David G. Ebenhack, Chem-Nuclear Systems, Inc., to M. Tokar, NMSS, NRC, attaching Chem-Nuclear Systems, Inc. report dated January 29, 1988, "Evaluation of Stress Loadings of CNSI HDPE HICS"
4. Memorandum dated June 15, 1988 from M. Tokar, NMSS, NRC, to S. J. Parry, ACRS, transmitting U.S. Nuclear Regulatory Commission, Division of Low-Level Waste Management and Decommissioning Report dated June 10, 1988, prepared by S. A. Silling, Brown University, "Review of the Structural Designs of Polyethylene High Integrity Containers"